

CLAIMS:

1. An actuator having a plurality of piezoelectric drives (1a, 1b, 1c) and a sphere (2) which is rotatable about at least two axes of rotation, characterized in that at least two piezoelectric drives (1a, 1b, 1c) have been provided in order to rotate the sphere (2) about at least two axes of rotation (7a, 7b, 7c), the piezoelectric drives (1a, 1b, 1c) being capable of transmitting their power to the sphere (2) in order to rotate this sphere about a respective axis of rotation by friction with the aid of vibrations in a tangential direction relative to the surface of the sphere (2).

2. An actuator as claimed in claim 1, characterized in that coupled-resonance piezoelectric motors are used as piezoelectric drives (1a, 1b, 1c), which motors transmit their power to the surface of the sphere (2) in a tangential direction in a first mode of operation, which perform longitudinal vibrations in a second mode of operation, and which can immobilize the sphere (2) in the last position reached in a self-braking manner in the switched-off state.

3. An actuator as claimed in claim 1 ~~or 2~~, characterized in that the sphere (2) is arranged in a shell which surrounds it, the piezoelectric drives (1a, 1b, 1c) are arranged inside the sphere (2), and power is transmitted from the piezoelectric drives (1a, 1b, 1c) to the inside of the shell.

4. An actuator as claimed in claims 1 ~~to 3~~, characterized in that three orthogonal axes of rotation (7a, 7b, 7c) are available, three piezoelectric drives (1a, 1b, 1c) are controlled in such a manner that a first piezoelectric drive performs a rotary movement about an axis of rotation, while a second piezoelectric drive, whose tangential plane of vibration extends parallel to this axis of rotation, reduces the friction in the fulcrum of the sphere (2), which fulcrum is associated with the second drive, and a third drive, disposed in the axis of rotation, stabilizes the axis of

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rotation in the fulcrum of the sphere (2) in the switched-off state of this third drive with which this fulcrum is associated.

5. An actuator as claimed in claims 1 to 4, characterized in that a contact pressure is exerted on the piezoelectric drives (1a, 1b, 1c) by the sphere (2), which contact pressure is provided by the weight of the sphere (2) itself, by a magnet or by a second sphere mounted on the sphere (2) to be rotated.

6. An arrangement for picking up pictures and/or sound, including an actuator as claimed in ~~any one of the claims 1 to 5~~ ^{claim 1}, characterized in that the sphere (2) of the actuator is adapted to accommodate a camera (3) and/or a microphone.

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1. The first part of the document is a list of references. The references are listed in a standard format, with the author's name, the title of the work, and the publisher. The references are as follows: